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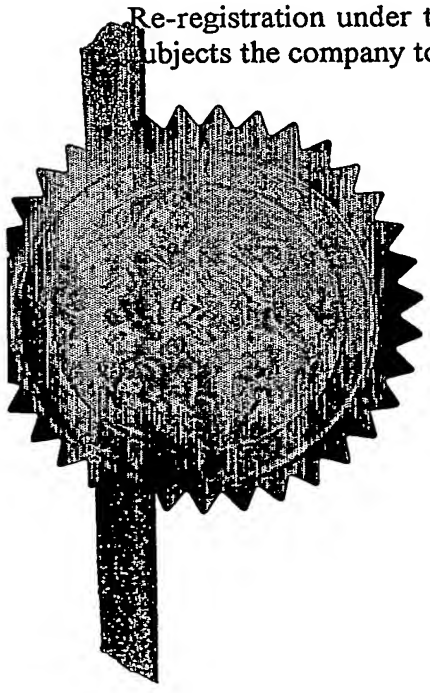

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Dated 15 September 2003

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The Patent Office

Cardiff Road
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1. Your reference — P016026GB

2. Patent application number *(The Patent Office will fill in this part)* — 0229767.9 — 23 DEC 2002

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

INTELLPROP LIMITED
PO BOX 626
NATIONAL WESTMINSTER HOUSE
LE TRUCHOT ST PETER PORT
GUERNSEY

Patents ADP number *(if you know it)*

If the applicant is a corporate body, give the country/state of its incorporation — A GUERNSEY COMPANY — 6894604001

4. Title of the invention — TELECOMMUNICATIONS SERVICES APPARATUS

5. Name of your agent *(if you have one)* — D Young & Co

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

21 New Fetter Lane
London
EC4A 1DA

Patents ADP number *(if you know it)* — 59006

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
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Yes

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Description	11
Claim(s)	0
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Priority documents	0
Translations of priority documents	0
Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	2 /
Request for preliminary examination and search *(Patents Form 9/77)*	0
Request for substantive examination *(Patents Form 10/77)*	0
Any other documents *(please specify)*	Facsimile Letter Dated 23 December 2002 /

11. I/We request the grant of a patent on the basis of this application.

Signature D. Young & Co. Date 23.12.02

D Young & Co (Agents for the Applicants)

12. Name and daytime telephone number of person to contact in the United Kingdom — Adam Pilch — 023 8071 9500

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TELECOMMUNICATIONS SERVICES APPARATUS

This invention concerns the field of telecommunications and in particular messaging systems for use with mobile telephone networks.

Text Messaging is established as a popular and effective means of communication for users of mobile telephones. The Short Message Services (SMS) of the GSM mobile telephony system provide an example of such a text messaging facility. and support for the composition, transmission and reception of Short Messages is present in the majority of GSM mobile terminals. SMS text messaging requires alphanumeric entry using the standardised Man Machine Interface (MMI) of the mobile handset. and also requires that the message be addressed to the desired recipient. Other forms of text messaging include EMS (Enhanced Messaging Service), MMS (Multimedia Messaging Service) and all such forms of text messaging are inclusively referred to be the term text messaging for the remainder of this document.

For person-to-person messaging, the destination address for a text message may typically be specified either by entering a Mobile Station ISDN number (MSISDN) that is the mobile telephone number of a desired recipient. or by selecting an entry from the handset's address book that already has the desired MSISDN or other address pre-programmed in. The address book normally provides the address by using alphanumeric look-up of a name.

The text messaging mechanism was originally defined for voice mail alerts in the form of SMS. and was extended to mobile-to-mobile text messaging. and later used for communication between mobiles and fixed entities in the network known as SMS Hosts. SMS Hosts are typically used for receiving the results of SMS voting events, or transmitting messages such as football results in bulk to users who subscriber to a premium service for example. SMS Hosts are responsible for an increasing proportion of SMS traffic.

One of the features of text messaging is that an identifier corresponding to the sender's identity is normally transmitted to the recipient. For example. in the GSM Short Message Service (SMS) it may not normally be optionally withheld by the sender. Exceptions to this include certain specialised services which may be offered by an operator. such as chat or dating whereby an alternative or temporary CLI is presented to the recipient. permitting reply but obscuring the originator's identity. Apart from such exceptions. the Calling Line Identity (CLI) is normally sent and may be displayed in the form of an MSISDN. though most handsets will translate this to an alphanumeric name if there is a corresponding MSISDN entry in the handset's address book. This provides ease of recognition of the sender. without the recipient having to remember telephone numbers. The mobile CLI feature is analogous to the CLI facility available on fixed networks. Another benefit of receiving CLI is that a reply to the message is more easily achieved. without having to explicitly specify the return address. The MMI for mobile handsets in GSM defines Reply as a standard feature.

As an alternative to transmission of the CLI identifier as an MSISDN. the GSM system also supports, for mobile terminated messages. the transmission of a short Alphanumeric value or name of up to 11 characters instead. Support for reception and correct display of an Alphanumeric CLI is widely available on recent mobile telephones. This facility is being used increasingly by SMS Hosts to brand the messages that are sent to subscribers. In most cases. telephone numbers associated with SMS Hosts or companies originating brand-related SMS traffic would not be pre-programmed into recipients' handsets. The CLI of such messages would therefore carry no value to the user in promoting or recognising the identity of the message source. By using an alphanumeric CLI (such as 'Coca-Cola' or 'Hertz') the user is immediately able to recognise the source. instead of receiving a message from an unrecognised number.

By using the built-in reply function. most handsets are able to reply to a message that has an alphanumeric CLI. In this case. the alphanumeric address becomes the destination address of the reply message. although in most cases the network will not support delivery of such a reply message.

In many cases, handsets are also able to originate messages with an alphanumeric destination address, and as services that make use of alphanumeric addresses increase in popularity it is likely that handset manufacturers will also improve the MMI in this area.

Prior art allows a mobile subscriber to send a text message from a mobile handset and have the message delivered as an email to a specified email address. However the syntax for specifying the email address on the mobile handset is cumbersome and slow, and hence the facility when offered by a network is relatively little used. A further disadvantage of this arrangement is that the user must know in advance the desired destination email address. Although the domain name of many companies can be guessed, the complete email address of a company department that is able to handle messages or queries sent by email is generally not guessable.

An additional complexity of such SMS to email services is that the reply path requires a correlation mechanism. When a message is originated from an email address and delivered to a mobile telephone, it is desirable that the mobile user should be able to reply to the sender using the SMS Reply function of the handset's MMI. To do this the CLI field of the original message delivered to the handset must contain a valid reply address. Since this can be either an MSISDN number or an 11 character alphanumeric string, it is not generally possible to directly store an email address there since it would usually be too long. Consequently the network must maintain a correlation mechanism. Typically, a special CLI value is generated and sent to the mobile handset with the message. The network stores the CLI value and the corresponding sender's email address. When the user replies, the special CLI is used as the destination address. This address causes the text message to be directed to the network's SMS-to-email gateway, where the corresponding destination email address is looked up and substituted.

A further shortcoming of current SMS addressing means is that it is not generally possible to call someone's mobile telephone number if you do not know it, even though you may know their company name and extension number. VPN services allow

this but only if the caller belongs to the same closed user group. People within the same company VPN may call each other using short numbers, but outsiders cannot make use of this facility.

It is also common for corporate messaging systems to include a facility whereby messages may be sent from a company's internal computer LAN or Intranet that are then converted to mobile text messaging format and sent over the air to a mobile telephone to be delivered as a text message. In this way messages may be easily sent from any fixed computer terminal attached to the company LAN to any other employee, in the manner of a VPN, or to any mobile phone. Typically the messages are converted to mobile air-interface format by use of a serial connection to a real mobile handset, though other means are possible, such as by means of a host-type connection to an SMSC.

'On net' employees (who are part of the VPN) would find it useful to be able to reply using the normal reply function of their handset's MMI, and to have the reply directed back to the originating computer terminal, or an associated mail account, on the company's LAN. However it is not generally possible for the mobile telephone user to either originate text messages that are deliverable to a corporate LAN, or to reply messages from such a corporate LAN. This is because the addressing capabilities of mobile text messaging are designed around an ISDN numbering plan, whilst user identities within a corporate LAN environment are typically short codes that are only unique within the company.

The present invention solves this problem, allowing two way text messaging between a corporate LAN and a mobile handset, while utilising the familiar short code addresses that are common within VPNs.

According to the invention there is provided a means for 2-way text messaging between a corporate LAN, Intranet or other computer network, hereon referred to as a corporate network user, and a mobile handset, such that messages initiated from the computer network side may be delivered to the handset while presenting a short-code

CLL and allowing the recipient to reply to the message using the normal mobile handset reply function such that the reply is delivered back to the correct corporate network with addressing information that allows it to be deliverable to the initiator.

According to Figure 1. a corporate network [2]. typically TCP/IP based though other technologies are applicable. has attached user terminals or workstations [1]. The network permits users to send text messages from the computer terminal [1] destined for mobile telephones [12] which may or may not belong to employees of the same company and which may be on any network. The corporate computer network [2] is connected via one or more radio telephones [3] to enable automatic sending of messages entered on computer terminals [1] as text messages over the air interface to transceivers [4] in a mobile telephone network. The message passes via Base station subsystem BSS [5] and Mobile Switching Centre MSC [6] and is intercepted by an SMS Router [7] before arrival at a Short Message Service Centre SMSC [8]. The SMS Router direct-delivers the message via an MSC [9]. BSS [10] and air interface [11].

Operation of the invention is facilitated by innovative use of the Reply-Path function defined for GSM mobile telephone systems. In normal use. each mobile handset is programmed with one or more default SMSC addresses. Mobile originated messages initiated from any network. even whilst roaming, are directed first to an SMSC of the subscriber's home network. The Reply-Path function changes this standard behaviour and was designed to allow a message recipient to send a single reply to a message via the Short Message Service Centre of the sender's network. instead of via his own service centre. In this case. the reply may be free of charge to the recipient but instead may be chargeable to the originator. In practice although the Reply-Path feature is implemented in the majority of mobile handsets. the SMSCs and networks do not support the intended functionality. The present invention makes use of the handset support for Reply-Path.

In a preferred embodiment. a user on a corporate network [2]. desires to send a text message from the computer terminals [1] to a mobile telephone [12] which may be on any network. The user. the "initiator". composes the message and sends it via the

computer network. The means of composition may involve use of an email client or may be a dedicated interface for sending text messages from a LAN. Alternatively the Internet may be used.

The message is addressed in some way which specifies the destination telephone. This may be a short code, but is preferably a full MSISDN so that the method of sending to on-net and off-net recipients is the same. Being on a corporate LAN, this is no disadvantage to the user, since a user-interface may be provided that allows the recipient to be selected easily by name from a list, or by another method.

The corporate network is connected to the mobile telephone network in which the invention is implemented. This may be via one or more dedicated handsets, typically connected to the computer network via serial connections, or a computer containing a GSM plug-in card or the like, that can be electronically instructed to place calls or send text messages by means of commands sent over an interface. Other methods are possible, for example via a host interface to the network, where the apparatus implementing the invention is arranged to be able to intercept these messages.

Each corporate network client of the system is pre-assigned a unique 'Short Message Service Centre (SMSC) address'. This address is the same as one of a number of addresses assigned to the SMS Router or other equipment that implements the invention. This address is used by the system to identify the corporate network, and to direct responses to its users. The corporate network addresses all outgoing messages to its assigned SMSC address thereby ensuring that all such messages are routed by the network to the apparatus instead of to a real SMSC.

In this example the text message is sent over the air interface into the mobile network. The message properties at this point are—

Format	Text message mobile originated
SMSC destination address	A pre-assigned SMSC address that both identifies the sending corporate network and also causes the message to be routed to the apparatus. e.g. 07800000100
Destination Address	The destination user's mobile number +447800123456
Originating address	Originating CLI of the corporate network's GSM interface equipment or handset. e.g. +44 7879 123456
Content	Identity of sender plus Message e.g. 4254.Please call John at the office.

The identity of the sending company must be determinable by the apparatus. In the preferred embodiment this is identified by the SMSC address used in the outgoing message, which is unique for each participating organisation. Other methods are possible, such as including a company identifier in the message content or in the originating address field.

To prevent spoofing of sender identities by other companies or malicious users, the SMS Router may be configured to only accept messages for processing by the invention if they originate from the known CLIs of the GSM interfaces of associated corporate networks, or from other whitelisted numbers. Optionally the CLI of the GSM interface may also be checked for correspondence with the SMSC address used, to prevent one associated corporate network from spoofing another.

In the preferred embodiment, the message is intercepted by an SMS Router. As described this has been achieved by using a special pre-assigned service centre address for each corporate network, that both serves to identify the corporate network and a global title for routing the message to the apparatus. This allows the mobile network to

simply route a block of Global Titles to the SMS Router(s) and allows the router to determine from the Global Title used in any reply to which corporate network the reply belongs. The SMS router maintains a lookup table which associates the pre-assigned SMSC addresses with an MSISDN for the GSM interface of the corporate network to which each is assigned.

In an alternative embodiment this part of the invention could be implemented within an SMSC instead of within an SMS Router.

In the preferred embodiment. the SMS Router determines that the message is addressed to a pre-assigned service centre number that indicates that the message is to be handled according to the invention. Accordingly. the message is transformed so that the message properties are—

Format	Text message mobile terminated
SMSC source address	Global Title of SMS Router(s) e.g. 07800444444
Destination Address	+447800123456
Originating address	4254
Content	Please call John at the office.
Reply-Path request Indicator	Set

The originator's identity has been extracted from the message as placed into the CLI field. The SMSC address used for routing the message to the apparatus is now present identified as the SMSC source address.

The Reply-Path indicator is set.

The SMS Router then direct-delivers the message to the intended recipient without involving an SMSC. In the event of non-delivery. the message may be directed to an SMSC for later store and forward delivery. or may be 'nacked' back to the sender for

him to try later. Alternatively, automated retry may be implemented within the corporate network or GSM interface computer.

A key feature of the invention is that on receipt of the message, the recipient may reply using the built in MMI reply function in his handset. If he does so, because the Reply-Path indicator is set, the handset will direct the reply not to the normal default SMSC, but to the Global Title of the SMS Router(s) which was set as the originating SMSC address in the message.

The properties of the reply message at this point are—

Format	Text message mobile originated
SMSC destination address	Global Title of SMS Router(s) e.g. 07800444444
Destination Address	4254
Originating address	+447800123456
Content	Will meet at 08:30

When the SMS Router receives a message directed to its own global title it knows that this is a message or a reply according to the invention. Messages and replies may be distinguished by the SMS router by means of the source (CLI) MSISDN. CLIs corresponding to the GSM interface of an associated corporate network identify an outgoing message from a corporate network. Other CLIs may be treated as replies to be delivered to the corporate network identified by the specific global title used.

In this case, the SMS Router uses the specific Global title 07800444444 to determine the identity of the recipient company, since there is a one to one correspondence, and uses the destination address as the identifier of the intended recipient.

In a preferred embodiment, the message is then converted to mobile terminated format and delivered to the corporate network GSM interface of the corresponding company.

with the recipient addressing information placed back into the message body so that the intended recipient (the originator) may be identified for delivery.
The properties of the reply message at this point are—

Format	Text message mobile terminated
Destination Address	MSISDN of the GSM interface equipment or handset. +44 7879 123456
Originating address	+447800123456
Content	4254.Will meet at 08:30

The corporate network mail application can then use the message content to deliver this message to the user associated with identity 4254.

In an alternative embodiment. the message is converted by the SMS Router to email format and delivered to the corporate network email system of the corresponding company. with sufficient addressing information so that the intended recipient (the originator) may be identified for delivery.
The properties of the reply message at this point may be—

Format	Email
Destination Address	4254@companyemaildomain.com
Originating address	+447800123456
Content	Will meet at 08:30

In these way. bi-directional communication may be achieved between a corporate LAN user and a mobile telephone user.

The invention also permits the mobile user to originate messages that are destined for the user on the corporate LAN. By originating a message in the following format, and changing his service centre address to the global title of the SMS Router that

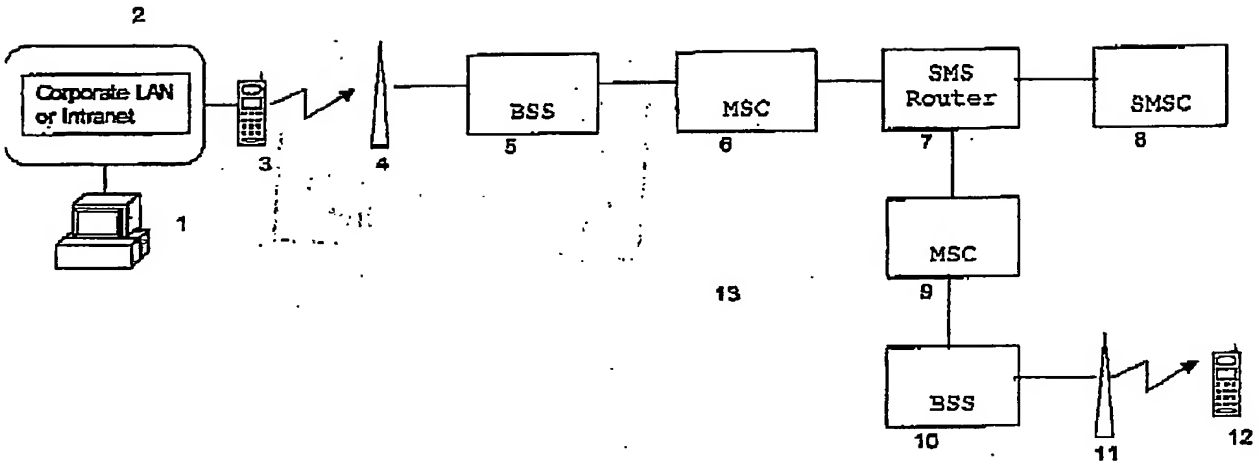
corresponds to the desired corporate network. behaviour is then the same as for a reply as previously described. In this case a white list of CLIs that are permitted to use any given corporate network pre-assigned SMSC address is desirable to prevent spoofing.

The properties of the originated message are—

Format	Text message mobile originated
SMSC destination address	Global Title of SMS Router(s) e.g. 07800444444
Destination Address	4254
Originating address	+447800123456
Content	Will meet at 08:30

The examples above have used a numeric short code as the identifier of the corporate network user. Alternatively other identifier types could be used, such as alphanumeric names or Ids, or VPN codes.

Figure 1


2
Corporate LAN or Intranet
1
3
4
BSS
5
MSC
6
SMS Router
7
SMSC
8
MSC
9
13
BSS
10
11
12